

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01L23/31 H01L21/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | US 6 306 685 B1 (LIU P C ET AL)<br>23 October 2001 (2001-10-23)  | 1                     |
| Y          | the whole document   | 10,11                 |
| X          | US 6 351 025 B1 (OHSAWA KENJI ET AL)<br>26 February 2002 (2002-02-26)  | 4,5,9                 |
| Y          | column 6, line 58 - column 8, line 43;<br>figures 1A,1B  | 10,11                 |
| A          | US 2002 027010 A1 (GLENN THOMAS P)<br>7 March 2002 (2002-03-07)<br>the whole document  | 1,9                   |
| A          | PATENT ABSTRACTS OF JAPAN<br>vol. 1999, no. 11,<br>30 September 1999 (1999-09-30)<br>& JP 11 163024 A (SUMITOMO METAL MINING CO<br>LTD), 18 June 1999 (1999-06-18)<br>the whole document | 1,9                   |
|            | -/-  |                       |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \* & \* document member of the same patent family

Date of the actual completion of the international search

9 September 2003

Date of mailing of the international search report

16/09/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Zeisler, P.

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| A          | <p>-&amp; JP 11 163024 A (SUMITOMO METAL MINING CO LTD) 18 June 1999 (1999-06-18)</p> <p>US 2002 038721 A1 (KANEDA YUTAKA)<br/>4 April 2002 (2002-04-04)<br/>the whole document</p> | 1,9                   |

## INTERNATIONAL SEARCH REPORT

Inter application No

PCT/IB 03/01299

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s)   | Publication<br>date  |
|---|----|---------------------|--|--|
| US 6306685                                | B1 | 23-10-2001          | NONE   |  |
| US 6351025                                | B1 | 26-02-2002          | JP 3003624 B2<br>JP 10335569 A<br>SG 68051 A1<br>TW 379429 B<br>US 6140153 A<br>US 6369441 B1<br>US 6403402 B1 | 31-01-2000<br>18-12-1998<br>19-10-1999<br>11-01-2000<br>31-10-2000<br>09-04-2002<br>11-06-2002 |
| US 2002027010                             | A1 | 07-03-2002          | US 2002100165 A1<br>US 6247229 B1  | 01-08-2002<br>19-06-2001   |
| JP 11163024                               | A  | 18-06-1999          | NONE   |  |
| US 2002038721                             | A1 | 04-04-2002          | JP 2002111185 A<br>CN 1346147 A<br>TW 497188 B   | 12-04-2002<br>24-04-2002<br>01-08-2002   |